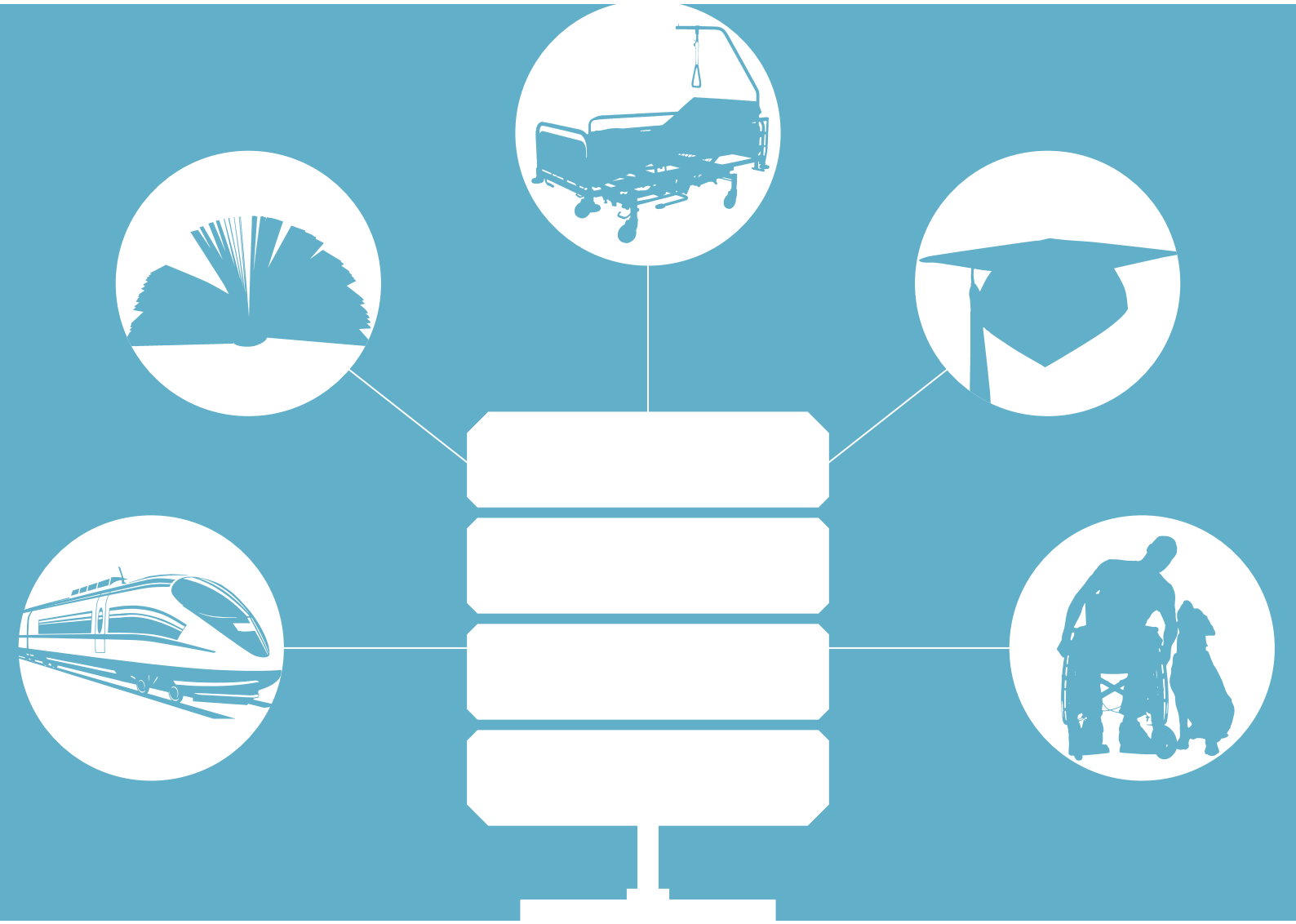
THINK ACT

POINT OF VIEW



BIG DATA

How data science can be serving public interest

Roland Berger
Strategy Consultants

Once a buzzword, Big Data has demonstrated its value in various business applications. Public initiatives, on the other hand, are still very limited and focus on open data or the emergence of a competitive Big Data sector. However, based on a worldwide benchmarking and projects, Roland Berger believes Big Data can also serve public interest by improving the effectiveness and efficiency of public policies.

Examples of successful Big Data applications are manifold. Whether in telecom, energy or insurance, many companies have implemented Big Data in order to better understand and target customers, optimize business processes, customize products, predict behaviors, etc.

Car insurers, for instance, have taken advantage of Big Data application to develop real usage-based insurance pricing. With the help of Big Data, traditional "Pay-as-you-drive" plans, based solely on the distance driven, have shifted to "Pay-how-you-drive" plans, taking into account the driver's behavior (e.g. speed, frequent lane changing, harsh braking).

Another example of how Big Data can deliver value comes from McDonalds. Clients' in-store movements have been analyzed on videos using facial recognition in order to improve in-store layout. Waiting times have been reduced and staff schedules and missions optimized, resulting in cost reduction and higher client satisfaction.

The success stories linked to Big Data in the private sector have started triggering the attention of the public sector. Open data initiatives, such as data.gov.be, make data available for free and maximize opportunities to develop new services but lead many public actors to "hide" their data. Other initiatives focus on how to facilitate the emergence of a competitive Big Data sector. However, limited attention has been paid to the huge impact Big Data could have on the effectiveness and efficiency of public policies and services.

Big Data pushes back the frontiers of traditional Business Intelligence

After decades of use, traditional Business intelligence has reached its limit. It is not capable of gathering, sorting and processing the ever larger volumes of data generated. On the internet only, the amount of data generated by e-commerce, social networks, connected devices, etc. will be multiplied by 44 in the next 10 years. By 2020, 20 bn devices (phones, cars, home appliances, glasses, etc.) will be connected to the Internet and producing data of different types (text, pictures, voice, temperature, location, etc.). This large variety of unstructured data cannot be processed by traditional systems. Finally, the speed at which data can be processed has increased, tending towards real-time information to reach sufficient levels of velocity.

While the 3Vs (volume, variety and velocity) are widely used to define Big Data, a more practical definition focuses on the technological revolutions which make traditional Business Intelligence (BI) outdated.

Big Data has emerged from the convergence of three major revolutions: artificial intelligence (semantics, pattern recognition) allows to process non-structured data, distributed computing (division of data across multiple computers and execution of computations in parallel) tremendously increases processing power and, finally, machine learning develops smart algorithms able to learn from data (algorithms building a prediction based on input data rather than following programmed instructions).

The public sector works to facilitate the emergence of a Belgian Big Data industry

Different studies indicate that the Big Data economy is expected to grow by 40% p.a. in the coming years. Therefore governments in most developed countries are supporting the development of national "data value chain".

Practically, to develop the Big Data industry the public sector is taking both structural and financial support measures, such as supporting flagship Big Data initiatives and clusters, facilitating R&D and infrastructure development, etc. For instance, the European Commission has budgeted EUR 500 m for a Public-Private Partnership (PPP) to stimulate investment in data-related projects. In Belgium, the Digital Minds initiative aims to encourage public and private actors to join forces to develop the digital sector in Belgium.

Big Data to improve the effectiveness and efficiency of public policies and services

Recent studies show that public operators are less familiar with Big Data than companies. However, this does not reflect the potential Big Data offers to improve public policies' effectiveness and efficiency or the quality of public services. A

Roland Berger has conducted a worldwide benchmark and identified relevant case studies of Big Data applications in the public sector. Health, employment and social inclusion, transportation and security are the five areas in which most initiatives take place.

For instance, the Seton hospital is combining structured (admission history, billings, etc.) and non-structured (family support, medical records) data about patients to assess their likelihood of being readmitted following a cardiovascular problem. As non-structured data represents ~80% of a patient's data, being able to exploit this information has significantly reduced mortality and costs while improving patients' quality of life.

In the education and employment fields, a telecommunication school in Leipzig has increased its courses relevance by identifying trends on the labor market. They are using a semantic analysis algorithm on non-structured data downloaded continuously from job offers, in order to identify the competences and long-term needs of the market.

In order to improve its public services, the city of Toulouse has put in place a pulse check of citizens' opinions towards public matters in real-time. Public documents are screened and combined with social media posts, surveys and opinion polls, allowing the city to adapt its actions in a faster and more appropriate way.

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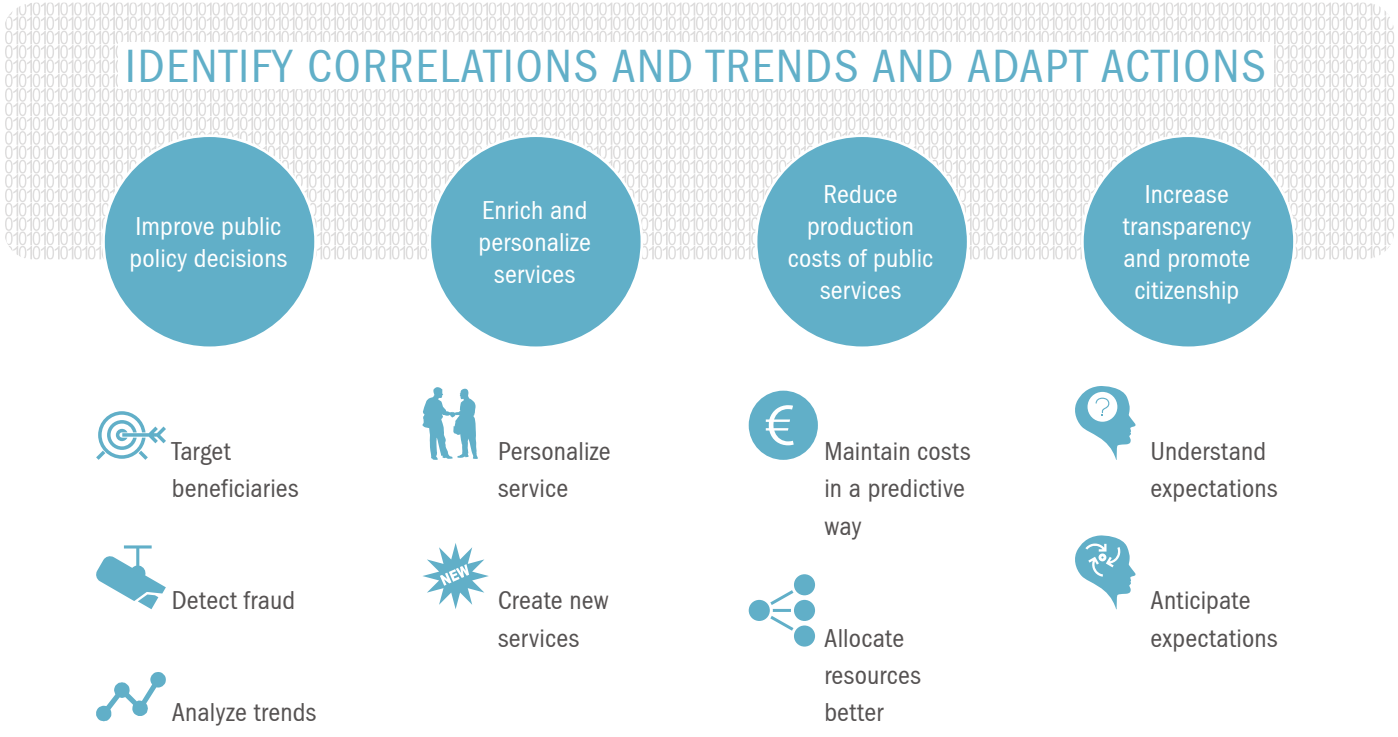
BIG DATA DRIVEN INNOVATIONS



In the public transportation domain, the US Rail has conducted a Big Data initiative to realize fully customized predictive maintenance, reducing mechanical problems by 75%, and maintenance costs by 20%.

Think big, act small and learn fast

The implementation logic of Big Data solutions is radically different than for CRM or ERP. For the latter, off-the-shelf solutions can be bought for thousands or millions of euros. The Big Data approach starts from the public policy issue analysis in order to design a fully customized solution. Therefore, the approach can be characterized by Think Big, Act Small and Learn Fast.

Think big is the essence of Big Data and leads to significant improvements of public policies. Act small refers to a trial-error approach with small but scalable pilots to be implemented with the help of cloud and open source solutions.

Learn fast stresses the importance of capitalizing on a strong ecosystem, experience and technology dynamics to continuously improve Big Data solutions.

Publisher

ROLAND BERGER
STRATEGY CONSULTANTS SA/NV
Vorstlaan 100 boulevard du Souverain 100
B-1170 Brussels | Belgium
+32 2 661 03 00
marketing.brussels@rolandberger.com
www.rolandberger.be

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PIERRE BASTIEN
Principal
pierre.bastien@rolandberger.com

AURÉLIE VANNESTE
Consultant
aurélie.vanneste@rolandberger.com

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